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IMPROVING JOINT FIRE SUPPORT FOR 21ST CENTURY HYBRID
WARFARE

by

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**A paper submitted to the Faculty of the Naval War College in partial satisfaction of
the requirements of the Department of Joint Military Operations.**

**The contents of this paper reflect my own personal views and are not necessarily
endorsed by the Naval War College or the Department of the Navy.**

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Abstract

One area where the struggles for achieving the desired synergy of “Jointness” are most evident is Joint fires. In the past periods of conflict have clearly brought these problems to light, and provided valuable lessons learned to guide improvement. The long conflicts in Iraq and Afghanistan have highlighted significant issues with Joint fire support. These issues include more responsive lethal fires and Joint Force HQs’ structured to effectively integrate lethal and NL fires into operations. Some analysts believe the current operating environment reflects what the Joint Force will likely have to deal with in the future. Additionally, the concept of hybrid warfare predicts that what we have seen will become more complex due to the proven adaptive nature of current enemy threats. With more of the same but worse expected in future conflicts, it is imperative that we aggressively work to solve the problems identified with Joint fires. This paper proposes that improvements can be made in joint fire support by creating a centralized point of authority for Fires integration, codifying the required Fires integration capabilities needed in the Joint Force HQs, and improving the responsiveness of the dynamic targeting process. These improvements will ensure the JFC has the Fires capabilities needed to succeed in future hybrid conflicts.

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Introduction

The United States Armed Forces have struggled for the past two and half decades to master the art of joint operations since the Goldwater-Nichols Act imposed “jointness” upon them in 1986¹. Joint fire support is an area where the struggles of achieving joint synergy have been most evident. In the past major conflicts have served as proving grounds for the joint force by bringing weakness to light, and providing valuable lessons learned to guide improvement. After Desert Storm the services identified weaknesses in joint fire support and took aggressive steps to find a better methodology prior to Operation Enduring Freedom (OEF) & Operation Iraqi Freedom (OIF) now referred to as the “Long War”². As a result the Joint Forces in Iraq and Afghanistan demonstrated a marked improvement in the performance of joint fires during the initial offensive phases of both campaigns. As the nature of the conflict changed in the Long War again weaknesses have been identified in Fires integration and responsiveness that need to be addressed to prepare the Joint Force for the future. Today analysts believe future conflicts will continue along the same trends as seen in the Long War, but with increased complexity^{3 4 5}. This combination of symmetric and asymmetric war is referred to as hybrid war⁶. Joint fires can provide the Joint Force Commander (JFC) with many capabilities needed to address this challenge, so it is critical that the problems identified in recent lessons learned be corrected. This paper proposes that improvement can be made in joint fire support by creating a centralized point of authority for Fires integration, codifying the required Fires integration capabilities needed in the Joint Force HQs, and improving the responsiveness of the dynamic targeting process. These improvements will ensure the JFC has the Fires capabilities needed to succeed in future hybrid conflicts

Background

The argument for improvement in joint fire support coordination is not a new one. Ever since technology enabled long range supporting fires from land, air and sea based platforms, commanders have always demanded more responsive and accurate fires to support the achievement of their objectives. The role of fire support coordination is to fully integrate Fires into the commander's concept of operations enhancing the maneuver forces' effectiveness in accomplishing objectives. There have been numerous articles and written since the mid-90s that argue joint doctrine needs to be revised to provide better guidance for ensuring the Joint Force Headquarters has an effective fire support capability^{7 8 9 10 11 12}. A common theme in these arguments for improvement has been that a Joint Fire Support Coordinator (JFSCOORD) is needed in the Joint HQ to improve unity of effort in fires coordination. Joint Publication 3-09 which covers fire support was revised in 2006, but the changes did not include a JFSCOORD position for the Joint Force HQ.

Another common theme is that joint doctrine does not provide enough guidance for what capabilities are needed in the Joint Force HQ to effectively integrate lethal and non-lethal fires. Lessons learned from the Long War have proven that non-lethal fires are a critical capability the JFC needs to engage enemy forces in restrictive COIN and stability operations. Units successful in integrating non-lethal fires have done so by creating robust fires cells with specific capabilities. Current Joint doctrine defines the equivalent of the fires cell as the Joint Fires Element (JFE). The JFE in JP 3-33, *Joint Force Headquarters*, is described as an optional staff element, and provides very general

guidance for how this cell should be organized ¹³. JP 3-33 states that the JFE is comprised of representatives from the J-3, and other JTF staff elements can be included, only specifying J-2 targeting staff and J-5 representatives. JP 3-33 goes onto state that the JFE is an integrating staff element that synchronizes and coordinates fires and effects planning on the behalf of the CJTF. JP 3-09, *Joint Fire Support*, echoes what JP 3-33 describes in regards to the organization of the JFE, only adding that a variety of experts from the joint force could be augmented as required¹⁴. Since the publishing of these primary Joint Publications regarding joint fire support, successful JFEs have been developed by JFCs in both theaters.

In 1991 the US achieved a decisive victory over Iraq in Operation Desert Storm, which also served as the first test of the joint operations concept. Joint fires facilitated the rapid collapse of Iraqi ground forces in a stunning four day ground offensive. However significant friction between the ground and air components arose as to how airpower should be utilized¹⁵. The Joint Force Land Component Commander (JFLCC) saw aviation assets as a fires capability and desired that the preponderance of air be focused on shaping efforts to weaken the Iraqi army prior to ground operations. The Joint Force Air Component Commander (JFACC) saw aviation as a separate element from fires, and felt the capabilities of air assets were best employed against deep strategic targets, such as Iraqi infrastructure and leadership nodes¹⁶. A highlight from the war was the Army's success with its Air-Land Battle doctrine. The results were an impressive demonstration of the decisive lethality that can be achieved from a modern combined arms team effort. The firepower synergy achieved by the Army inspired the services to work toward making improvements to joint fire support that could achieve the same

success at the operational level. During the 1990's these lessons were incorporated into training and doctrine which significantly improved the effective integration of air support with ground maneuver and fires¹⁷.

During the first conflicts of the 21st century in Afghanistan (2001) and Iraq (2003) US forces demonstrated an unprecedented degree of air-ground coordination and integration. In Afghanistan, US special forces working with indigenous forces used air power in close coordination to quickly expel the Taliban from its sanctuaries in the country, only months after the 9-11 attacks. In Iraq, ground maneuver began simultaneously with air operations to preclude the Iraqi regime from undertaking a predicted scorched earth campaign. US air supremacy was quickly established over Iraq, and coalition air forces shaped the fight to allow for rapid dominance on the ground¹⁸. The benefits of technological advances since Desert Storm were impressive with air and sea launched precision guided munitions (PGM) strikes that responded rapidly to the targets developed by improved intelligence, surveillance, and reconnaissance systems¹⁹. In addition to the improvements of air ground integration, technological advances in precision munitions and space-based C2 networks enabled combat operations to occur in ways only imagined a decade before.

Defining the Problem

Despite these successes, as the campaigns transitioned from conventional combat operations to phase IV operations, the true nature of 21st century warfare became evident. US forces became more involved in COIN and stability operations, and the conditions, and requirements for providing joint fire support changed. Lessons learned from OIF and OEF reveal four significant problems with Joint Fire support that must be resolved in

preparation for future hybrid war. These problems include lack of responsiveness of joint fires, the inability to utilize many precision fires capabilities available, an overreliance on close air support, and the ineffective integration of non-lethal fires. These challenges became evident during different stages of the Long War.

During the initial stages of both campaigns the nature of the conflict was defined by major combat operations. In OEF the nature of the terrain and the lack of deployed organic artillery units resulted in ground maneuver forces having to depend predominantly on air platforms to provide fire support. When weather conditions allowed, improved air integration provided devastatingly effective fires, but this dependence on air power presented problems. Initial reports from Afghanistan stated:

Joint fires, despite the successes alluded to, were by no means uniformly timely and accurate. Ground commanders complained that they did not always get the support they needed on time. Op ANACONDA also demonstrated a continuing requirement for organic immediate suppressive fires that, despite their best efforts, fighter aircraft could not deliver²⁰.

Air support played a crucial role, but an all-weather direct fire support capability was needed.

During the initial invasion of OIF the terrain and improvements in air/ground integration enabled the joint team to produce the synergy desired in fires. Reports from this period stated that on more than one occasion, responsive, accurate close air support turned the tide for Army ground units²¹. Commanders were able to simultaneously engage targets with both their organic artillery assets and air support decisively destroying Iraqi Army units in short order. In both theaters, after the cessation of major combat operations the enemy blended in with the local populations and adapted their tactics to unconventional warfare methods. One of the most significant challenges was

being able to identify and rapidly engage the enemy threat. Multiple armed groups organized under diverse causes to oppose US forces and their allies. As large insurgencies developed, US forces transitioned to primarily COIN operations. COIN operations required the JTF to gain and maintain the support of the local populations in each theater. In regards to fires, reducing collateral damage was added to the already complicated task of targeting the elusive insurgent threats. Technological advances in precision guided munitions (PGMs) have created more options for the JFC the use in COIN operations^{22 23}.

In the past precision munitions were exclusive to air platforms. Large precision guided bombs like the 1,000 - 2,000lb Joint Direct Attack Munitions (JDAM) became harder to employ for COIN operations. In response to the need to reduce collateral damage a 250lb JDAM was developed for use in urban terrain²⁴. In addition to traditional air delivered PGMs, smart artillery munitions such as Excalibur and Guided Multiple Launched Rockets (GMLR) became available. These smaller precision strike weapons proved effective in taking out high value targets (HVTs) in dense urban terrain. In one example from Iraq in 2007 during the “Surge,” Excalibur was used for the first time to kill a ranking al-Qaeda commander named Abu Jurah. The 155mm projectile hit the house where Abu Jurah was pinpointed by Predator UAV. The house was completely destroyed, but no damage was observed to any of the neighboring structures²⁵.

Despite examples of successful joint fires integration, recent lessons learned indicate this was not the norm. In many instances commanders conducting COIN operations have reported that the Dynamic Target Approval process was not responsive enough, and negated their ability to use the smaller PGMs^{26 27 28}. This problem stems

from the tedious collateral damage estimate (CDE) process that targets had to go through prior to approval. In many cases the approval authority was retained as high as the JTF level. The 1st Cavalry Division Fires Cell echoed this problem in their recent AAR from Afghanistan stating: Excalibur response time is too slow to support commanders when Close Air Support and Air Weapons Teams (CAS/AWT) are on station²⁹. Another recently deployed Fires Cell from the 101st Airborne Division reported that CAS was the most responsive means for supporting troops in contact, and for precision fires³⁰. The reports from both of these units indicate two fire support issues. First, a proven PGM is not readily available for commanders conducting COIN because of coordination and clearance challenges. Second, CAS is the current weapon of choice for precision fires and in some instances immediate suppression. What makes this second point a problem is that CAS is not an all-weather capability, and the current operational environment in Afghanistan has created a unique situation in which US airpower has the luxury of focusing solely on providing CAS for maneuver commanders³¹. This overreliance on CAS is a problem in preparation for future hybrid conflicts where the availability of air power may be more restricted³².

Another challenge identified in lessons learned regarding fire support is the importance of non-lethal (NL) fires in conducting COIN operations. In COIN operations NL fires enables the JFC to engage insurgents in restrictive situations, such as when they are intermixed with the local population. NL fires enabled US forces to gather intelligence, disrupt enemy command and control, counter enemy disinformation, and reduced the local populations support to the enemy³³. Despite this realization it took time for US forces to actually learn how to put NL fires into practice. In 2005 reports from

Iraq the Army surmised that due to poor synchronization, poor feedback mechanisms and no doctrinal foundation – NL fires had little “effect” on OIF operations³⁴.

In 2008 the importance of NL fires in current operations was codified by the revision of the Army’s FM 3-0, *Operations*, which established NL fires as part of the Fires War fighting function. This doctrinal revision formalized the expanded role of fire supporters as the integrators of both lethal and NL fires³⁵. The initial efforts made in Iraq by JF HQ – CJTF-7 in trying to integrate lethal and NL fires during OIF II, found that the traditional fires cell organizational design and manning did not fulfill the functional requirements necessary to support the full spectrum environment³⁶. The traditional HQ organization was too stove piped it did not facilitate close working relationships and information exchanges needed between the various staff components to effectively integrate NL fires. As the campaigns continued, these areas were addressed and improvements were made through the efforts of creative and resourceful JFCs³⁷.

In 2006, III Corps HQs transitioned to the Multinational Corps Iraq HQ for OIF V. III Corps implemented organizational adaptations such as the Joint Fires Cell and placed a Deputy Commanding General (DCG) in charge of it. Additionally III Corps created eight functional staff cells under its improved Joint Fire Cell, all supervised by the DCG-Fires. In addition to lethal fires, these cells focused on Information Operations (IO), Targeting, Electronic Warfare (EW), and mission specific areas such as Engagements and Reconciliation³⁸. The effectiveness of the Mult-National Corps Iraq’s (MNC-I) organizational adaptations enabled the JFC to recognize the “Sunni Awakening” in 2007, and exploit a critical opportunity for reconciliation. LTG Raymond Odierno the MNC-I commander stated:

“The joint fires cell operated just like FM 3-0 says it should. It was responsible for synchronizing all lethal and NL fires. The cell worked across the full spectrum of effects. It monitored and synchronized all those programs and developed policy for me to ensure we allocated our assets in the key areas”³⁹.

During this same period in Afghanistan the 10th Mountain DIV (10th MTN) assumed responsibility for Combined Joint Task Force -76 (CJTF-76) for OEF VII. As in the case of III Corps, the JFC had to reorganize his staff and create a Fires cell to facilitate integration. 10th MTN adopted an effects based approach and formed a Joint Effects Cell (JEC). The JEC was to integrate related NL activities such as: information operations (IO), psychological operations (PSYOP), public affairs, and civil-military operations (CMO) into conventional and day-to-day operations⁴⁰. Lethal fires for 10th MTN were integrated under the traditional Deputy Fire Support Coordinator and his Joint Fires Cell. The lethal and NL fires were by separate cells, but as with III Corps a DCG was placed in charge to provide authority and oversight of integration for both types of effects into operations. These non-standard modifications to the JF HQ allowed CJFT-76 to effectively shape its operations as can be seen in the results of Operation Mountain Lion conducted in 2007.

During Operation Mountain Lion, coalition forces cleared over 2500 enemy combatants from the battlefield and established 12 new outposts taking up a permanent presence to facilitate engagement. Effective governance was extended into new areas via construction of approximately 1300 kilometers of new roads, 53 district centers, 18 schools, and over \$500 million in projects. All actions were integrated and synchronized in concert with the JEC’s battle rhythm⁴¹.

These examples from both OIF and OEF show how JFCs adapted their HQs to effectively integrate both types of fires into their operations, and how their Joint Fires Cells produced positive results. Despite these lessons learned current joint doctrine does not clearly reflect these needed organizational changes to the JF HQ.

This analysis regarding the problems experienced in Joint Fire Support during the Long War highlights areas where improvement is needed to better prepare the Joint Force HQ for hybrid warfare. These areas include more responsive lethal fires by improving the Dynamic Target Approval process and a requirement for Joint Force HQs' structured to effectively integrate lethal and NL fires into operations.

Recommended Improvements to Joint Fire Support

The current operating environment reflects what Joint Forces will likely have to deal with in the future. The concept of hybrid warfare predicts not only that future war will likely present these same challenges, but that what we have seen will become more complex as the enemy adapts^{42 43}. The complexity will entail the Joint Force encountering different forms of conflict simultaneously. The Joint Force must be able to conduct full spectrum operations and have the flexibility to rapidly shift from one form to another. Recognizing the current problems and understanding what is required for the future, three areas for improvement in Joint Fire Support become clear: Unity of effort is needed to ensure effective integration of lethal and NL fires, a dynamic targeting capability must improve the responsiveness of lethal fires, and forces must be flexible to rapidly shift operations along the spectrum of conflict.

In regards to improved unity of effort in fire support, MNC-I and CJTF-76 provide good examples. Successful integration of fires was achieved when a single point of authority was established to focus on fires integration. The role of the Fires war-fighting function has expanded to include a wider range of capabilities to assist the JFC in shaping the operational environment. In the cases of MNC-I and CJTF-76, both JFCs demonstrated the value they placed on effective fires integration by putting their DCGs in

charge of their JFEs. LTG Odierno stated that the MNC-I fires cell in 2007 needed the experience, expertise and authority of a general officer as its chief⁴⁴. In the case of smaller JTFs, and in future campaigns that require more direct combat action, a general officer may not be optimal to focus on fires. This same oversight and unity of effort for fires integration could also be attained under a Joint FSCOORD position. Fire Support officers provide this capability for lower echelon unit commanders. Serving as integrators for fires is not a new role for Army and Marine field artillery officers. The revision to FM 3-0 in 2008 formalized the expansion of the fire supporters' role to include both lethal and nonlethal fires integration⁴⁵. In short both the ground services have branches which specialize in fires integration, and since the model for the FSCOORD already exists in lower echelon ground units, it seems clear that this effective fires integration process should be replicated at the joint level to improve unity of effort in joint fires support.

The enemy forces of the Long War have proven to be a thinking and adaptable threat. They have effective information networks and are typically well attuned to the operational environment. Despite technological disadvantages, the enemy is well connected through commercially available communications mediums, and has been able in many cases to organize and adapt their tactics faster than US and coalition forces. The enemy operates on home turf and has the advantage of time, which enables them to engage when it is to their advantage. These capabilities have made effective targeting of the enemy extremely difficult. When targets of opportunity develop, the reaction time for US forces is fleeting. In order to use fires effectively under these conditions US forces must be able to rapidly detect targets, decide whether they can be engaged with Fires, and

deliver the required munitions in near-real-time – what the Fires community calls the D3 process. This highlights the necessity of a responsive Dynamic Targeting Process for joint fires. Current ISR technology has advanced rapidly during the Long War, and joint forces have the capability to rapidly detect targets. The breakdown in the process occurs at the Decide portion of D3. The necessity to avoid collateral damage has led to a meticulous procedure for verifying a target is legal and accurately located. The verification process known as a collateral damage estimate (CDE), while minimizing collateral damage, it also slows down the dynamic targeting process, and in turn decreases the responsiveness of lethal fires.

There are several recommendations being discussed to improve dynamic targeting. First, as stated in Combined Joint Task Force-1Fire cell’s lessons learned report, units must understand the CDE process and its systems in order to facilitate its use, and train to execute it effectively⁴⁶. This supports the need to ensure that the Joint Fires Cell (JFE) is manned by fire support experts. Another recommendation to speed up the targeting process is to ensure that the JFE has right types of experts, and enough of them to manage the expected volume of targets. Several sources referenced suggested that current technology and available resources do not allow the JFHQ to cope with the volume of targets being requested in a timely manner⁴⁷. The solution is to push the Dynamic control and decision making authority down to the tactical level in the absence of effective automation⁴⁸. This option would speed up the process by eliminating a level of clearance, and would place the decision process closer to the user level.

These recommended solutions for improving the dynamic targeting process also directly relate to improving the flexibility of joint fire support. A more robust JFE in

addition to improving Fires integration would also give the joint force HQ a greater capability to seamlessly transition between the different levels of conflict. The ability to rapidly shift along the spectrum of conflict is important for success in hybrid war given the expected simultaneity of different conflicts. Fires cells must have enough experts readily available to coordinate and integrate both lethal and NL fires simultaneously. Fires cells pulled together from an Ad hoc team of available personnel, or a cell that is specialized for only one type of conflict, will not have the flexibility required for hybrid war.

Ways to Solve the Problem

The first step to improving joint fire support should be revisions to joint doctrine. JP 3-33 should be revised to include the creation of a standing JFSCOORD position in the joint force HQ. The creation of this senior officer to manage fires for the joint forces was strongly supported by both JFCs in the successful cases of MNC-I and CJTF-76. Effective integration of fires involves the close cooperation of multiple staff components and functional cells. Keeping these diverse staff elements focused requires unity of effort that can only be provided by a single point of authority. It is unrealistic to believe that the JFC or the J-3 would be able to fill this role considering the diverse level of expertise and full time management required to effectively integrate fires. A JFSCOORD will provide the expertise needed to manage fires integration for the JFC. Another recommended revision to JP 3-33 would be to make the JFE a required functional cell for the joint force HQ. With the inclusion of NL fires as part of the Fires war fighting function, any future hybrid war will require some level of fires integration. JP 3-33 covers the formation of the joint force HQs, which makes it the appropriate joint

publication for capturing the primary capabilities needed in a standard Joint Force HQ.

The minimal capabilities needed in the JFE to effectively integrate lethal and NL fires based on lessons learned include: lethal fires element, air support element, information operations element, targeting element, and C2 warfare / electronic warfare element.

Mandating these specific capabilities in doctrine ensures the JFE has the diverse expertise needed to effectively integrate fires into the JFC's operational plans.

In addition to revising doctrinal guidance to facilitate improvements in joint fire support, the Army has existing organizations capable of providing the capabilities recommended to the joint force HQ. The Corps HQs has a fire support cell organized with the recommended elements to cover the full range of fires integration needs, and has an O-6 FSCOORD assigned. The Army Division used to form smaller joint HQs has a fires cell similar to the Corps, but with fewer personnel and a more junior O-5 FSCOORD. To make up for the shortages in the DIV fires cell, normally Fires Brigades are attached to division HQs⁴⁹.

Fires Brigades (FiB) are the only Army field artillery organization currently without permanent assignment to an Army Division. These organizations are designed to support any joint, Service, or functional HQ. The FiB gives the supported commander a HQ specialized in planning, synchronizing, and executing fire support⁵⁰. When the FiB is designated as the Force Field Artillery HQ by a supported Division commander, the FiB Commander (O-6) assumes the responsibility as FSCOORD for the Division⁵¹. The FiB also has a Fires Cell built into its organization capable of integrating lethal and NL fires. Though typically used to support or augment divisions, the FiB can also augment its capabilities to support Corps and other Joint HQs. All three of these Army

organizations are proof that the capability exists to establish a standing JFSCOORD within in the joint force HQs. Also these organizations provide the expertise and personnel to standardize the capabilities required in the JFE to ensure the joint force is capable of effectively integrating fires for full spectrum operations.

Finally in regards to improving the responsiveness of lethal fires, MG David Halverson the Commanding General of the US Army Fires Center of Excellence stated, that the Dynamic Control and Decision Making in targeting must be pushed down to the tactical level⁵². A current initiative known as the Joint Air Ground Integration Cell (JAGIC) is being developed and tested in accordance with MG Halverson's observation. JAGIC is a joint Army/Air Force integration effort, focused on improving the responsiveness of fires and improving airspace integration at the division level. JAGIC is an integration cell that combines division Fires with a modular Air Support Operations Center (ASOC), and a Tactical Air Control Party (TACP). This new organizational concept was tested during FY 11, and initial results indicate that the JAGIC provides the division with a flexible joint agency which enhanced their ability to access joint Fires platforms, and the integration of joint airspace users in support of critical division tasks⁵³. JAGIC is a promising move in the right direction to improve the lethal side of joint fire support. Existing organizations were modified to correct problems identified in lesson learned from the Long War. This same realization of what's needed, and innovation to break with traditional organization structures, should also be utilized to improve issues identified in regards to the JFSCOORD and the JFE.

The Opposing Viewpoint

Current doctrine gives the JFC the freedom to tailor his headquarters according to the requirements of his mission and the environmental conditions of the Joint Operational Area (JOA). The diverse nature of joint operations may not always require significant fire support coordination; therefore it can be argued that the optional FSE is sufficient. Additionally JP 3-33 already recommends an Information Operations Cell and Joint Targeting Coordination Board under the J-3. Also requirements for Fires integration not prescribed in joint doctrine exist in lower echelon units, and responsibility for integrating aspects of fires support can be pushed down or augmented as needed. In regards to the Joint FSCOORD position, as in the case of MNC-I, a senior officer can be assigned to the position if needed. Based on previous JFC commanders' success in adapting the current model for the Joint HQ in recent conflicts, it can be reasoned that the guidance in Joint doctrine is sufficient, and the JFC's fire support capability should not be prescribed.

The historical trend that US forces always prepare for the previous war, only to be surprised when the next one is different, holds true for our current joint doctrine. This doctrine seems tailored for primarily mid-intensity COIN, stability & reconstruction operations. In the cases of MNC-I and CJTF-76 they had to significantly modify their Fires cells because they were overwhelmed by the volume of information that had to be managed. Both JFCs also found it necessary to establish leadership positions with the centralized authority required to effectively integrate NL fires. This paper is not arguing to take away the commander's ability to tailor his staff. Those who understand doctrine know that it is a guideline or starting point. One of the most valuable aspects of doctrine is that it shortens the learning curve by capturing the basics of best practices from

previous conflicts. The JFC still has the freedom to form non-standard HQ if needed, but the recommended changes will capture what joint fires cells have needed historically.

Conclusion

As we draw down in Iraq and Afghanistan the services are once again at point where lessons learned from a recent period of conflict provide an opportunity to improve the performance of joint fire support for the next war. Current initiatives such as JAGIC and the effective utilization of existing Fires organizations, certainly have the potential to improve some of the weaknesses identified. Joint doctrine can also play an important part in the solution, codifying the proven methods for successful integration of lethal and NL fires into Joint operations. These needed improvements represent the way ahead for ensuring joint fire support is prepared to provide the JFC with the decisive edge needed for success in future hybrid wars.

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¹⁵ MAJ Kevin Foster, U.S. Marine Corps, "Operational Fires: Improving Doctrine to Apply the Operational Art to Fires" (U.S. Naval War College, February 4, 2002) 3.

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¹⁷ Fontenont, *On Point*, xxvi.

¹⁸ Ibid., xxv.

¹⁹ Ibid.

²⁰ Ibid., 25.

²¹ Ibid., 405.

²² Dale Andrade, *Surging South of Baghdad: The 3rd Infantry Division and Task Force Marne in Iraq, 2007-2008* (Washington, D.C.: Center of Military History U.S. Army, 2010), 155.

²³ Anthony H. Cordesman, The Lessons of Afghanistan: War Fighting, Intelligence, and Force Transformation, Washington, D.C. :Center for Strategic and International Studies Press, 2002), 44.

²⁴ Ibid., 43

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²⁶ Jeff Moyer, *Lessons Learned Umbrella Week Senior Video Teleconference (SVTC) with 101st CJTF Fires Cell Executive Summary*, Fires Center for Excellence, Fort Sill, Oklahoma, April 27, 2011 (Center for Army Lesson Learned (CALL) Fires Team), 2.

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³⁰ Moyer, 101st CJFT Fires Cell EXSUM, 1-2.

³¹ Meredith, Memorandum for CG FCoE, 8-9.

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³³ FM 3-0, *Operations*, 3-5.

³⁴ Hall, *Operational Fires*, 19.

³⁵ Frank J. Siltman, and John P. Frisbie, "Fire Support Just Got Harder: Adding Nonlethal Fires as a Core Competency." *Fires*, July - September (2008): 6.

³⁶ Granger, *Integration of Lethal and Nonlethal Fires*, 22.

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³⁹ Patricia S. Hollis, "Fires for the 2007 Surge in Iraq: Lethal and Nonlethal." *Fires*, May-June (2008): 8.

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⁴² Frank Hoffman, "Hybrid Warfare and Challenges." *Joint Forces Quarterly*, no. 52, 1st Quarter (2009): 36-37.

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⁴⁶ Wendel, *Meeting Notes from CJTF-1 Fires Cell Post Deployment Interview*, 2.

⁴⁷ MG David Halverson, US Army, Fires Conference VTC presentation, *Joint Fires*, Fort Sill, Oklahoma, (U.S. Army, Fires Center of Excellence), 2011, slide 3.

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⁴⁹ U.S. Army Field Artillery School, *Fires Brigade Roles, Missions and Functions*: White Paper, September 26, 2011 (Fort Sill, Oklahoma), 1.

⁵⁰ FM 3-09, *Fire Support*, (Washington D.C.: HQ Department of the Army, November 2011), 2-1.

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